

What is claimed is:

1. An electronic control device comprising:
 - a control circuit substrate forming an electronic circuit inclusive of electronic parts;
 - a casing containing therein said control circuit substrate and having connectors for external connection thereof;
 - a metallic mounting plate having, and integrally formed together therewith, an external mounting portion and a frame-like fitting member in which a plurality of support portions for supporting said control circuit substrate are erected surrounding the opening in the bottom surface; and
 - a power circuit substrate which includes a metallic substrate and is fitted to the opening in said bottom surface, forming a drive circuit inclusive of power control elements electrically connected to said electronic circuit, and exposing the lower surface of the metallic substrate.
2. An electronic control device according to claim 1, wherein when said power circuit substrate is fitted to the opening in said bottom surface, there is formed a mounting surface and the mounting portion, the frame-like fitting member, and the lower surface of said power circuit substrate are on the same plane.
3. An electronic control device according to claim 2, wherein said mounting plate is mounted on an external heat-absorbing member by said external mounting portion, and said mounting surface is brought into contact with the surface of said external heat-absorbing member.
4. An electronic control device according to claim 1, wherein said control circuit substrate is a heat-resistant resin substrate, and a space is formed by said support portion relative to said power circuit substrate.
5. An electronic control device according to claim 4, wherein said electronic parts are connected to the lower surface of said control circuit substrate.

6. An electronic control device according to claim 5, wherein a heat-radiating portion is provided in said space to radiate the heat of said electronic parts to said mounting plate.

7. An electronic control device according to claim 6, wherein said heat-radiating portion is made of a metal plate which is supported by said support portion so as to come in contact with said electronic parts.

8. An electronic control device according to claim 6, wherein

said heat-radiating portion has a belt-like heat conducting member arranged in said space, said belt-like heat conducting member being continuously formed integrally with said frame-like fitting member so as to come in contact with said electronic parts.

9. An electronic control device according to claim 8, wherein a heat conducting and elastic adhesive layer is interposed between said electronic parts and said belt-like heat conducting member.

10. An electronic control device according to claim 8, wherein said belt-like heat conducting member has a recessed portion for accommodating said electronic parts, and said recessed portion is filled with a heat conducting gelatinous material.

11. An electronic control device according to claim 4, wherein the ends of a plurality of lead conductors extending from said connectors for external connection and the ends of a plurality of lead conductors extending from said power circuit substrate, protrude beyond the side surface opposite to said power circuit substrate through the lead conductor holes formed in said control circuit substrate so as to be connected to said electronic circuit formed on said control circuit substrate.

12. An electronic control device according to claim 4, wherein a socket or a plug connected to said power circuit is disposed on the upper surface of said power

circuit substrate, and a plug or a socket to be connected to said electronic circuit is disposed on the lower surface of said control circuit substrate by being engaged with said socket or the plug.

13. An electronic control device according to claim 12, wherein said socket and said plug have surface contact portions that slide in one direction relative to each other.

14. An electronic control device according to claim 1, wherein said power circuit substrate is fitted to said frame-like fitting member in the inner peripheral portion of the opening in said bottom surface by using a heat conducting and elastic adhesive.

15. An electronic control device according to claim 3, wherein said external mounting portion has a fastening portion for fastening and securing said external heat-absorbing member.

16. An electronic control device according to claim 15, wherein said fastening portion has at least two protruding portions integrally formed with said mounting plate in a direction at right angles with said mounting surface, and tightening screws that fit to the protruding portions.

17. An electronic control device according to claim 3, wherein said power circuit substrate has engaging protrusions corresponding to engaging recessed portions formed in the surface of said external heat-absorbing member, and the engaging recessed portions and the engaging protrusions are press-contacted in the direction of said mounting surface due to the fastening force produced by said fastening screws.

18. An electronic control device according to claim 3, wherein said power circuit substrate has a threaded engaging portion that protrudes from the bottom surface of said substrate, and said threaded engaging portion is screwed into said external heat-absorbing member so that said power circuit substrate is intimately adhered onto

said external heat-absorbing member.

19. An electronic control device according to claim 3, wherein said power circuit substrate is screwed into said external heat-absorbing member with a heat conducting elastic layer interposed therebetween.

20. An electronic control device according to claim 3, wherein said power circuit substrate is secured upon coming in contact with a plurality of protrusions formed on the surface of said external heat-absorbing member.

21. An electronic control device according to claim 3, wherein said power circuit substrate is secured to said external heat-absorbing member via heat conducting elastic balls arranged in a groove formed in said external heat-absorbing member.

22. An electronic control device according to claim 3, wherein said external heat-absorbing member is a housing of a transmission of an automobile.

23. An electronic control device according to claim 3, wherein said power circuit substrate is cooled by a lubricating oil in the transmission housing of an automobile.